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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,521	10/06/2003	Jay Yu	VIAP0086USA	2520

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NORTH AMERICA INTERNATIONAL PATENT OFFICE (NAIPC)
P.O. BOX 506
MERRIFIELD, VA 22116

EXAMINER	
NADAV, ORI	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/605,521	YU ET AL.	
	Examiner	Art Unit	
	ori nadav	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/27/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a first conductive trace formed on the top wiring layer (the first wiring layer), as recited in claim 1, and conductive traces disposed on separate wiring lavers, as recited in claim 3, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1 and 9 recite a second wiring layer is disposed below and parallel to a first wiring layer. That is, the first wiring layer is the top layer. Figure 3 depicts first and second conductive traces formed between the first and second wiring layers. There is no support in the disclosure for a first conductive trace formed on the top wiring layer (the first wiring layer), as recited in claims 1 and 3, and there is also no support for conductive traces disposed on separate wiring lavers, as recited in claim 3.

Figure 3 depicts a plurality of conductive traces formed on a second wiring layer. There is no support for a plurality of conductive traces formed on a plurality wiring layers, as recited in claim 3.

Figure 3 depicts a plurality of conductive traces formed in first and second parallel wiring layers, interconnected by vias. There is no support for a conductive trace having at least an end disposed coincident (i.e. occupying the same space) with an end of a conductive trace disposed on a separate laver, as recited in claim 3.

There is no support for the claimed limitation of one end of each conductive trace being directly connected to one end of a corresponding conductive trace, as recited in claim 8.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed limitation of a first conductive trace formed on a first wiring layer, as recited in claims 1 and 9, is unclear because, if the first conductive trace is not part of the first wiring layer, as stated by applicant, which wiring is present in the first wiring layer, what is the purpose and the structural connectivity of the first wiring layer to the device, and how the first conductive trace is separated from the first wiring layer (the first conductive trace must be electrically separated from the first wiring layer in order not to short circuit the device.

The claimed limitation of each conductive trace having at least an end disposed coincident with an end of a conductive trace disposed on a separate laver, as recited in claim 3, is unclear as to how the end of each conductive trace can coincident (i.e. occupying the same space) with an end of a conductive trace disposed on a separate laver, since the conductive traces are formed on parallel wiring layers.

The claimed limitation of conductive traces being formed on the first wiring layer skewed symmetrically with respect to conductive traces, as recited in claims 7 and 8, is unclear as to how conductive traces formed on the first wiring layer can be skewed (deviated from a straight line) symmetrically with respect to conductive traces formed on a parallel second wiring layer.

The claimed limitation of one end of each conductive trace being directly connected to one end of a corresponding conductive trace formed on a separate wiring layer through one of the plurality of via plugs, as recited in claim 8, is unclear as to whether one end of each conductive trace is directly connected to one end of a corresponding conductive trace formed on a separate wiring layer, or one end of each

conductive trace is connected to one end of a corresponding conductive trace formed on a separate wiring layer through one of the plurality of via plugs.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

Claims 1-12, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Liou (6,037,649) in view Gardner (6,452,247). Liou teaches in figure 2A and related text a printed circuit inductor of a printed circuit board with at least a first wiring layer and a second wiring layer comprising:

a first conductive trace formed on a first wiring layer M2;

a second conductive trace formed on a second wiring layer M1, wherein the second wiring layer M1 is disposed below and parallel to the first wiring layer M2, the layers being separated by an insulating material;

a third conductive trace formed on the first wiring Ayer and parallel to the first conductive trace;

a fourth conductive trace formed on the second wiring Ayer and parallel to the second conductive trace;

a first via plug 24 directly connected to a first end of the first conductive trace and a first end of the second conductive trace;

a second via plug directly connected to a second end of the second conductive trace and a first end of the third conductive trace; and

a third via plug directly connected to a second end of the third conductive trace and a first end of the fourth conductive trace

wherein the first via plug, the second via plug and the third via plug are positioned along two parallel lines; or the first via plug, the second via plug and the third via plug are aligned but not positioned along two parallel lines; or the first via plug, the second via plug and the third via plug are not aligned.

Liou does not state that the device is formed on a printed circuit board.

Gardner teaches in figure 1 forming an inductor on a printed circuit board 10

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form Liou's device on a printed circuit board in order to use the device in practical application.

Regarding claim 2, Liou teaches in figure 2A and related text the first via plug is perpendicular to the first conductive trace, the second via plug is perpendicular to the second conductive trace, and the third via plug is perpendicular to the third conductive trace.

Regarding claim 3, Liou teaches in figure 2A and related text a printed circuit inductor comprising;

a plurality of conductive traces formed on a plurality of wiring layers of a printed circuit board, wherein the conductive element of the inductor is formed from interconnected conductive traces disposed on separate wiring lavers M1, M2, M3 each conductive trace having at least an end disposed coincident with an end of a conductive trace disposed on a separate laver allowing interconnection by a via;

a plurality of insulating layers 21, 23, 26 for isolating the conductive layers from each other; and

a plurality of via plugs each directly connecting the conductive traces on different conductive layers.

Regarding claims 4-6, Liou teaches in figure 2A and related text a plurality of conductive layers is formed having two layers, wherein the plurality of via plugs is perpendicular to the plurality of conductive layers, and wherein the magnetic field generated by the inductor is in parallel with the conductive Layers.

Regarding claims 7-8, Liou teaches in figure 2A and related text conductive traces formed on the first wiring layer are skewed symmetrically with respect to conductive traces formed on the second wiring layer, wherein one end of each conductive trace is directly connected to one end of a corresponding conductive trace formed on a separate wiring layer through one of the plurality of via plugs, and wherein the conductive traces formed on a first separate wiring layer are parallel to each other and skewed symmetricaiiy with respect to the corresponding conductive traces formed on a second

separate wiring layer, the traces formed on the second separate wiring layer being parallel to each other.

Regarding claims 9-12, Liou teaches in figure 2A and related text a second conductive trace substantially not parallel to the first conductive trace (in one plane),

wherein an angle formed in the plane of the first wiring layer between a vector from the third via plug to the first via plug and a vector from the third via plug to the second via plug is substantially a right angle, acute angle and obtuse angle, depending on the selected via plugs.

Response to Arguments

Applicant argues that there is support in the specification for a first conductive trace formed on the top wiring layer (the first wiring layer), as recited in claim 1, and for conductive traces disposed on separate wiring lavers, as recited in claim 3.

Although the disclosure recites a first conductive trace formed on the top wiring layer (the first wiring layer), it appears (from figure 3) that the first conductive trace is part of the first wiring layer, because no other wiring is present in the plain of the first wiring layer. If the first conductive trace is not part of the first wiring layer, then which wiring is present in the first wiring layer, what is the purpose and the structural connectivity of the first wiring layer to the device, and how the first conductive trace is separated from the first wiring layer (the first conductive trace must be electrically separated from the first wiring layer in order not to short circuit the device.

Applicant argues that there is support in the specification for a conductive trace having at least an end disposed coincident with an end of a conductive trace disposed on a separate laver, as recited in claim 3.

Figure 3 depicts a plurality of conductive traces formed in first and second parallel wiring layers, interconnected by vias. Clearly, a conductive trace does not have at least an end occupying the same space (coincident) with an end of a conductive trace disposed on a separate layer. Therefore, there is no support for a conductive trace having at least an end disposed coincident with an end of a conductive trace disposed on a separate layer, as recited in claim 3.

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(571) 272-1660**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

O.N.
2/16/05

ORI NADAV
PRIMARY EXAMINER
TECHNOLOGY CENTER 2800